MATH OLYMPICS

Suggested Grade

4

SD Mathematics Strand & Standard *(Primary for Task)*

Measurement

4.M.1.3. Students are able to measure length to the nearest quarter inch.

Task Summary

Students investigate accurate measurement and graphing of data.

Time and Context of Task

3 days- following lesson on measurement

Materials Needed

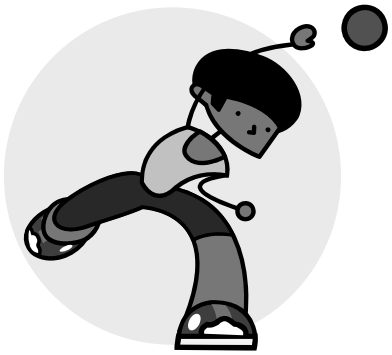
Cotton balls, paper plates, straws, measuring tape

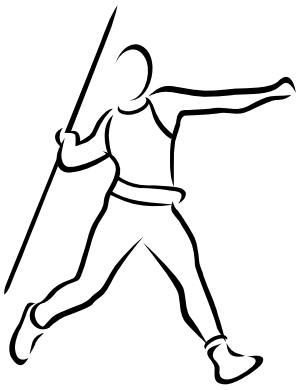
Author and Lead Teacher for this Task

Kelly Hinds
Simmons Elementary, Aberdeen SD

MATH OLYMPICS

Students will work in partners. They will participate in the cotton ball throw, (shot put), paper plate throw (discus) and the straw throw (javelin). Each student will estimate the distance they can throw each of these items. They will then make their first throw, measure the distance to the nearest quarter inch and record the measurement. Then they may make any adjustments necessary in their estimating. They throw each item 3 times and using their best distance they will graph the three results. They may choose a bar graph or a line graph. After graphing their results they will present their graphs to the class. By interpreting the data on the graphs the students will determine who receives the gold, silver and bronze medal for each event.





CONTENT STANDARDS

Primary Standard

Strand Name: Measurement
SD Goal: Students will apply systems of measurement and use appropriate measurement tools to describe and analyze the world around them.
Indicator: Apply measurement concepts in practical applications.
Standard: 4.M.1.3. Students are able to measure length to the nearest quarter inch.

Supplemental Standard

Strand Name: Statistics and Probability
SD Goal: Students will apply statistical methods to analyze data and explore probability for making decisions and predictions.
I**ndicator:** Use statistical models to gather, analyze and display data to draw conclusions.
Standard: 4.S.1.2. Students are able to interpret data from graphical representations and draw conclusions.

NCTM Process Standard

Representation

- Create and use representations to organize, record, and communicate mathematical ideas

Problem-Solving Strategies

- Estimation and check
- Drawing pictures, graphs, and tables

ASSESSMENT TOOLS

Task Rubric

Standard	Advanced	Proficient	Basic	Below Basic
4.M.1.3. Students are able to measure length to the nearest quarter inch	*In all measurement problems-- Accurate estimates are given to the nearest inch. Appropriate units and tools are used to solve measurement problems. Accurate measurements are taken to the nearest quarter inch.*	*In most measurement problems acceptable estimates are given to the nearest inch. Appropriate units and tools are used to solve measurement problems. Accurate measurements are taken to the nearest quarter inch.*	*Appropriate units and tools are used to solve measurement problems. Some inaccuracy in measurements.*	*Inability to choose appropriate measurement tools. Inaccurate measurements.*
Standard: 4.S.1.2. Students are able to interpret data from graphical representations and draw conclusions.	*Collected data from measurements is accurately represented and interpreted in graphs created by students.*	*Data is correctly interpreted from graphical representations*	*Questions are answered from graphical representations.*	*Unable to interpret data or ask questions from graphical representations.*
Create and use representations to organize, record, and communicate mathematical ideas	*Mathematical representation expanded on solution.*	*Mathematical representations helped clarify solution.*	*Mathematical representations were somewhat helpful in clarifying thinking.*	*Mathematical representations did not help clarify your thinking.*

Fourth Grade Measurement
Performance Descriptors

Advanced	**Fourth grade students performing at the advanced level:** • choose appropriate units and tools to solve measurement problems; • determine equivalent units of time; • solve problems involving time.
Proficient	**Fourth grade students performing at the proficient level:** • measure temperature, capacity, length, and weight; • solve problems involving money; • identify equivalent periods of time.
Basic	**Fourth grade students performing at the basic level:** • measure length and weight in whole units.

Fourth Grade Measurement
ELL Performance Descriptors

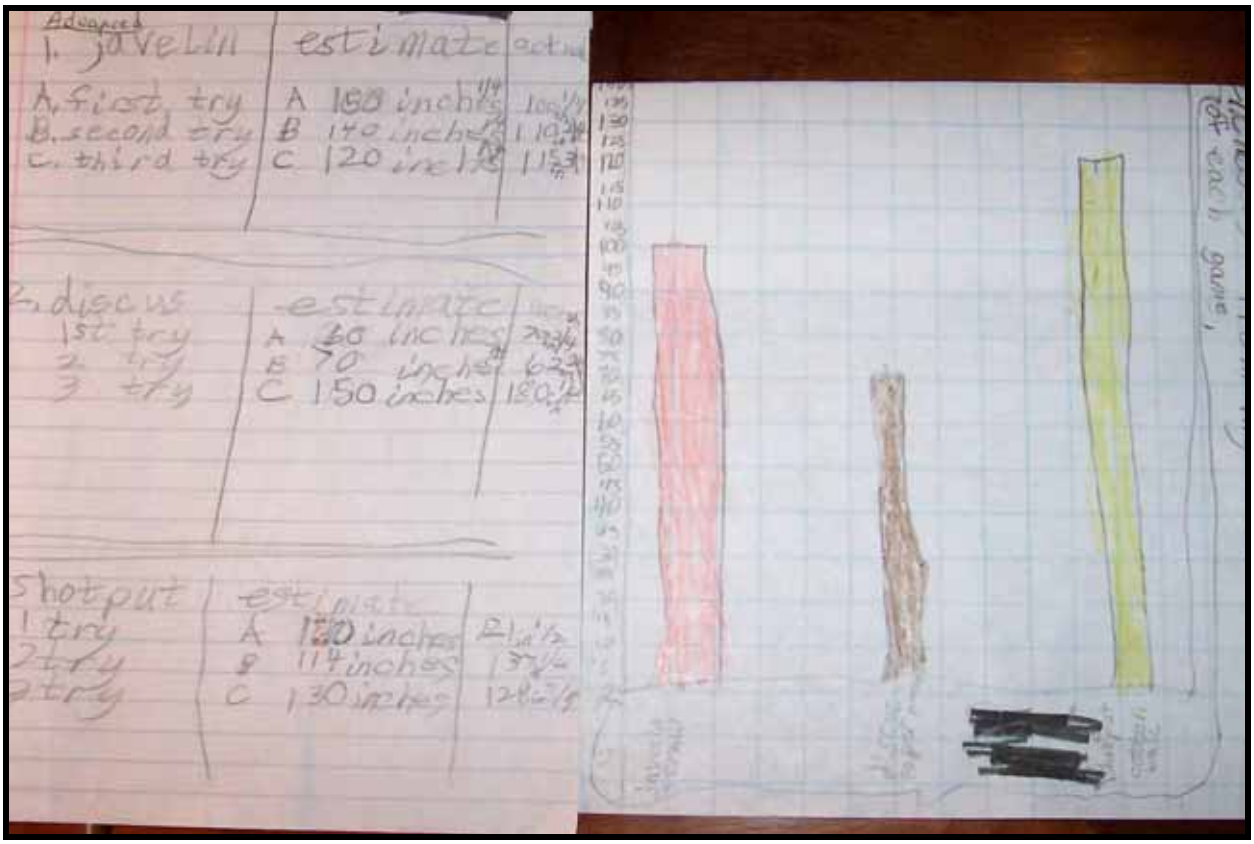
Proficient	**Fourth grade ELL students performing at the proficient level:** • use various tools to make accurate measurements within the U.S. Customary system to solve problems; • read, write, and speak the language of mathematics.
Intermediate	**Fourth grade ELL students performing at the intermediate level:** • use the basic measurement tools in the standard system; • use measurement terms to explain how to solve problems; • give simple oral or written responses to directed questions on topics presented in class.
Basic	**Fourth grade ELL students performing at the basic level:** • recognize measurement tools used in various situations; • recognize and use basic measurement terms; • respond to yes or no questions and to problems presented pictorially or numerically in class.
Emergent	**Fourth grade ELL students performing at the emergent level:** • copy and write measurement symbols; • imitate pronunciation of measurement terms; • use non-verbal communication to express measurement ideas.
Pre-emergent	**Fourth grade ELL students performing at the pre-emergent level:** • observe and model appropriate cultural and learning behaviors from peers and adults; • listen to and observe comprehensible instruction and communicate understanding non-verbally.

Math Olympics
Student Work Samples

As you examine the samples, consider the following questions:

- In light of the standard/s addressed and the assessment tools provided, what evidence does the work provide that students are achieving proficiency in the knowledge and skills addressed by the standard/s for the task?
- Is the task/activity well designed to help students acquire knowledge and demonstrate proficiency? Is the task/activity clearly aligned with the standards? In what ways would you adapt the task/activity to better meet the needs of your students?

Student Work Sample #1

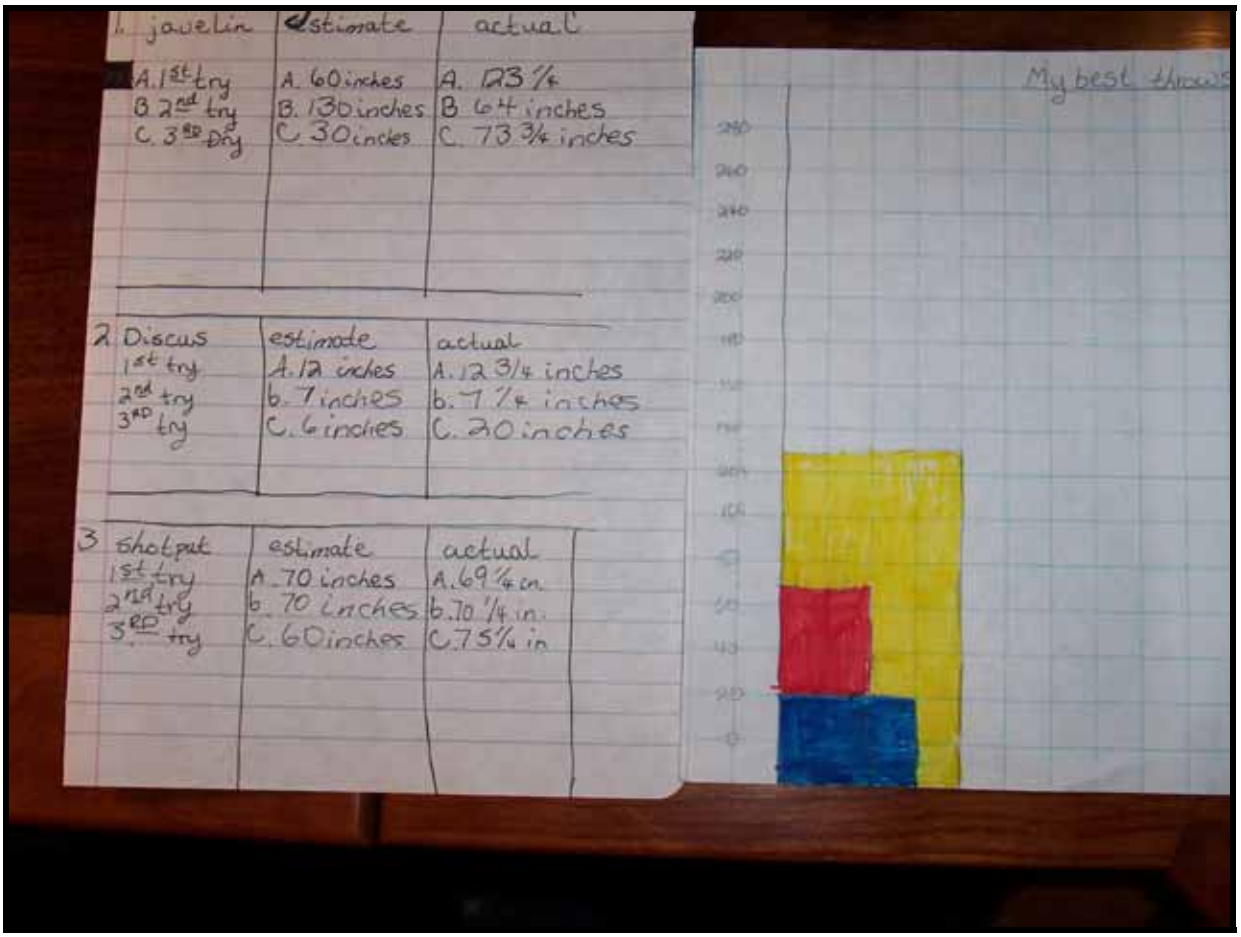


Looking at Student Work – Instructor notes and rating for work sample #1:

Based on the task rubric and the Content Standard Performance Descriptors, the lead teacher rated this student's work ADVANCED.

What evidence do you see in the student work that demonstrates that this student has an ADVANCED skill level?

Student Work Sample #2

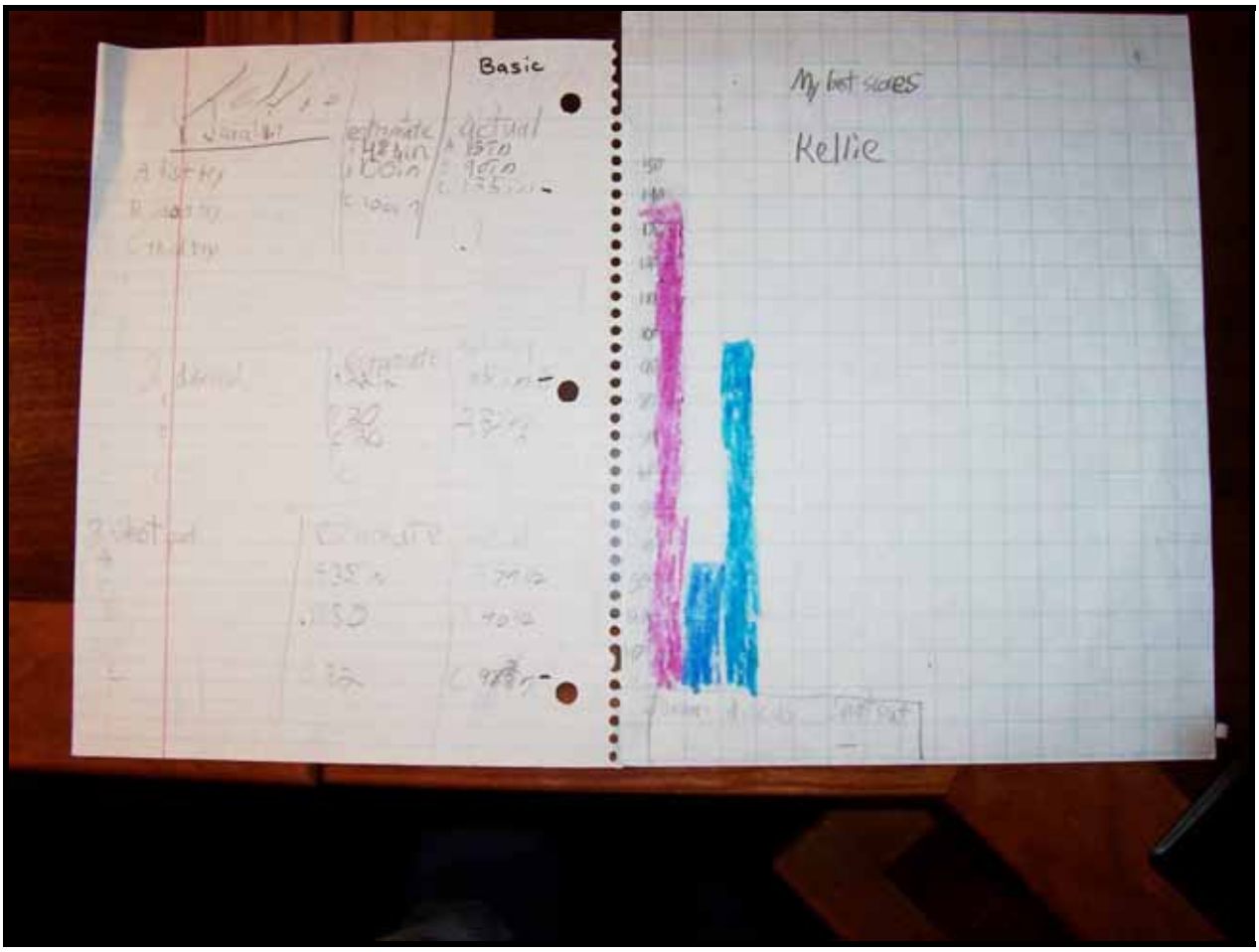


Looking at Student Work – Instructor notes and rating for work sample #2:

Based on the task rubric and the Content Standard Performance Descriptors, the lead teacher rated this student's work PROFICIENT.

What evidence do you see in the student work that demonstrates that this student has a PROFICIENT skill level?

Student Work Sample #3

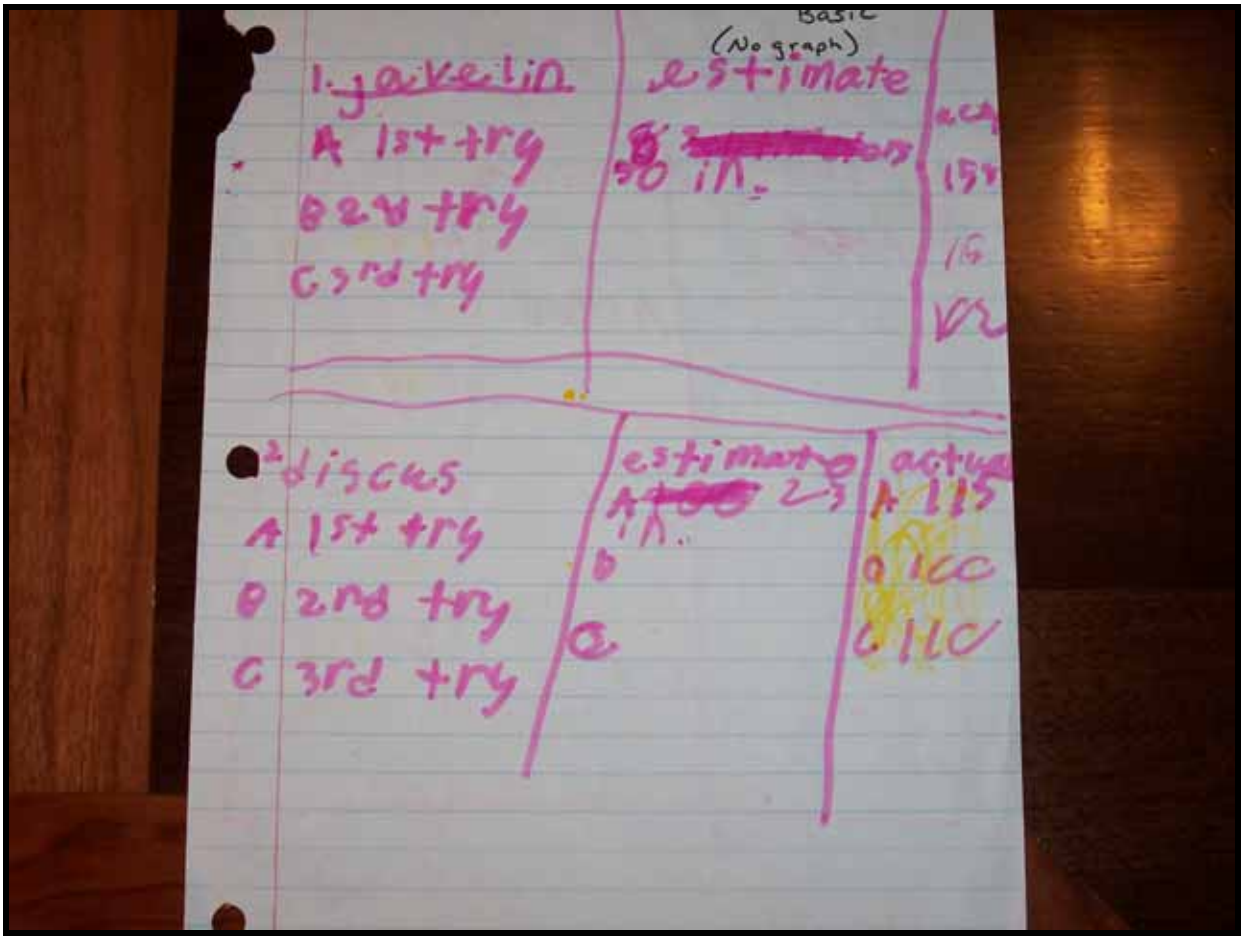


Looking at Student Work – Instructor notes and rating for work sample #3:

Based on the task rubric and the Content Standard Performance Descriptors, the lead teacher rated this student's work BASIC.

What evidence do you see in the student work that demonstrates that this student has a BASIC skill level?

Student Work Sample #4



Looking at Student Work – Instructor notes and rating for work sample #4:

Based on the task rubric and the Content Standard Performance Descriptors, the lead teacher rated this student's work BELOW BASIC.

What evidence do you see in the student work that demonstrates that this student has a BELOW BASIC skill level?

INSTRUCTIONAL NOTES

Web Resources

Interactive Student Sites

- http://pbskids.org/cyberchase/games/decimals/decimals.html
- http://pbskids.org/cyberchase/games/dataclusters/dataclusters.html
- http://pbskids.org/cyberchase/games/measurement/index.html

Teacher Lesson Plan Sites

- http://www.edhelper.com/olympics.htm
- http://www.enchantedlearning.com/olympics/
- http://kidzone.ws/math/w-olympics/#WORKSHEETS4
- http://www.springfield.k12.il.us/schools/Iles/math/olympicindex.html

Interdisciplinary Connections

Geography-location of past and present Olympic games

Literature Connections

Twelve Snails to One Lizard by Susan Hightower
Stop the Watch, Klutz Press
Olympics by B.G. Hennessy
Eyewitness: Olympics by Chris Oxlade

Resources

SD Mathematics Content Standards
http://www.doe.sd.gov/contentstandards/math/index.asp

SD Assessment and Testing
http://www.doe.sd.gov/octa/assessment/index.asp

The National Assessment of Educational Progress (NAEP)
http://www.doe.sd.gov/octa/assessment/naep/index.asp

National Council of Teachers of Mathematics
http://nctm.org/

Looking at Student Work
http://www.lasw.org/index.html